

**PATENT APPLICATION**

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the Application of

Tomoaki TODA

Application No.: 10/810,729

Filed: March 29, 2004

For: SEMICONDUCTOR LASER AND LASING OPERATION



Group Art Unit: 2828

Examiner: H. SAYADIAN

Docket No.: 119312

**PRE-APPEAL BRIEF REQUEST FOR REVIEW**

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Sir:

A Notice of Appeal is attached. Applicant respectfully requests review of the Final Rejection mailed November 3, 2006 and the Advisory Action mailed March 29, 2007 in light of the following remarks. Claims 1-5, 11-13, 15, 16, 19 and 25-30 are pending. All of the pending claims are rejected. This review is requested for the following reasons.

**I. The Amended Claims Do Not Introduce New Matter And Are Definite**

The Office Action alleges Applicant's Amendment filed August 9, 2006 introduced new matter. Further, apparently referring to the same language amended into claim 1, the Office Action rejects all of the pending claims under 35 U.S.C. §112, first paragraph, as failing to comply with the written description requirement. The Office Action rejects claims 1-5, 11-13, 15, 16, 19 and 25-33 under 35 U.S.C. §112, second paragraph, as being indefinite. The Advisory Action withdraws the rejection of claim 28 under 35 U.S.C. §112, second paragraph. Applicant respectfully traverses the remaining objection and the rejections.

The language asserted to be new matter is supported at least at paragraphs [0015] and [0027] where Applicant's disclosure, as originally filed, states "if the first semiconductor layer group and the second semiconductor layer group are controlled appropriately to adjust the amount of the electrons and the holes to be injected into the active layer, the excitation in the active layer

can be controlled." Further, with respect to the use of the terms "constituting" and the correspondence of the recited semiconductor layer groups and bipolar transistors, for example, in claims 1 and 16, Applicant's disclosure at least in paragraph [0021] states "[i]n the semiconductor layer group 20, the p-type base layer 13, the active layer 14 and the n-type layer 15 constitute a pn junction type semiconductor laser. The n-type emitter layer 12, the p-type base layer 13, the active layer 14 and the n-type base layer 15 constitute a first semiconductor layer group functioning as an npn-type bipolar transistor. The p-type base layer 13, the active layer 14, the n-type base layer 15 and the p-type emitter layer 16 constitute a second semiconductor layer group functioning as a pnp-type bipolar transistor." As such, the amended claim language specifically objected to in the Office Action clearly finds support in Applicant's disclosure, as originally filed.

MPEP §2163 paraphrases §112, first paragraph, stating "[t]o satisfy the written description requirement a patent specification must describe the claimed invention in sufficient detail that one skilled in the art can reasonably conclude that the inventor had possession of the claimed invention," and also states "an applicant shows possession of the claimed invention by describing the claimed invention with all of the limitations using such descriptive means as words, structures, figures, diagrams and formulas that would fully set forth the claimed invention."

There is no requirement that the language of the claim be identical, and/or verbatim, to the language in the written description (see MPEP §1302.1). The totality of Applicant's disclosure supports the above-quoted standards and satisfies the written description requirement with respect to the amended claims..

The Final Rejection also asserts that the introductory phrase "functioning as" deprives the specifically recited features of "a first bipolar transistor" and "a second bipolar transistor" of their self-evident antecedent basis effect in the claim. This assertion is incorrect and unsupported by any identified law or rule.

Accordingly, reconsideration and withdrawal of the objection to the August 9 Amendment, and the rejections under 35 U.S.C. §112, first and second paragraphs, are respectfully requested.

**II. Specific Features Recited In The Pending Claims Are Neither Taught, Nor Would They Have Been Suggested, By The Applied Prior Art Reference**

The Office Action rejects claims 1-5, 11-13, 15, 16, 19 and 25-30 under 35 U.S.C. §102(b) over U.S. Patent No. 5,677,552 to Ogura. This rejection is respectfully traversed.

Claim 1 recites, among other features, wherein the successively formed [layers] a first semiconductor layer group which functions as a first bipolar transistor, and the first bipolar transistor is controlled to adjust an amount of electrons to be injected into the active layer, and wherein [other] successively formed [layers] constitute a second semiconductor layer group which functions as a second bipolar transistor, and the second bipolar transistor is controlled to adjust an amount of holes to be injected into the active layer, and wherein by controlling at least one of said amount of electrons and said amount of holes to be injected into said active layer, an intensity of light generated and oscillated is modulated. Claim 16 recites similar features.

Ogura teaches a thyristor laser. A thyristor laser turns the flow of electrons or holes On and Off only. It cannot adjust an amount of electrons or holes. Although the On/Off threshold in Ogura can be adjusted by adjusting an intensity of light, Ogura does not disclose, nor can it reasonably be considered to have suggested, that it is possible to adjust the amount of electrons and holes by corresponding first and second bipolar transistors, respectively.

The Advisory Action improperly asserts that any recited function of the structural features recited in the claims can be performed by allegedly corresponding structures disclosed in Ogura. Ogura does not control first and second bipolar transistors at least because such control would be impossible given the circuit shown in Figs. 3 and 4 of Ogura. Fig. 4 of Ogura may show four electrodes, but all four electrodes are not used at the same time. Rather, using the four electrodes in Ogura would simultaneously turn on and off the laser.

Ogura fails to teach, or even to have suggested, that the disclosed pnpn semiconductor structure and thyristor laser control technique using that structure can reasonably be considered to teach, or to have suggested, the laser control technique positively recited in the pending claims. Controlling the amount of holes or electrons is not at all disclosed in the thyristor laser control technique of Ogura. Nor can such a feature be inferred from the disclosure of Ogura.

Applicant's March 5, 2007 Amendment After Final Rejection argued that, based on the totally different methodologies of Ogura and the present subject matter, it is not as simple a matter as the Office Action suggests to merely lump together a method for oscillating a semiconductor laser as is positively recited in claim 16 with a semiconductor laser structure, finding that simply based on some similarity in structure, the method of control is anticipated. The Office Action appears to state that the reason for rejection of at least claim 16 is based on a control technique which is clearly not disclosed in Ogura. Ogura's laser is a common thyristor laser, having no other function for controlling an applied voltage except a power supply voltage applied to both ends. The driver circuit has no function of directly controlling a potential across the device of Ogura. Further, Ogura does not disclose at all replacing the driver circuit for the purpose of potential control of each layer.

Regarding claims 29 and 30, Ogura requires a thyristor having a low threshold voltage for switching in order to switch rapidly. The redundantly inserted GaAs layer suggested by the Office Action would severely impact performance of the thyristor laser, thereby rendering it unsuitable for its intended purpose. Moreover, nothing in Ogura suggests that a voltage high enough to cause a Gunn-effect can be applied. Finally, inserting a n-type GaAs layer used for a common Gunn element where the Examiner indicates would be inconsistent with the pnpn structure disclosed in Ogura.

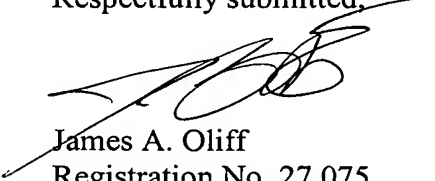
Accordingly, reconsideration and withdrawal of the rejection of claims 1-5, 11-13, 15, 16, 19 and 25-30 under 35 U.S.C. §102(b) as being anticipated by Ogura are respectfully requested.

**III. Summary**

In view of the foregoing, Applicant respectfully requests that the Review Panel review the substance of the November 3 Final Rejection in light of the above remarks. Applicant believes that upon such review, the Review Panel will determine that a *prima facie* case for obviousness of the subject matter of the pending claims over Ogura has not been established and that the amended claims are definite and contain no new matter. In this regard, favorable reconsideration and prompt allowance of claims 1-5, 11, 13, 16, 19 and 25-30 are earnestly solicited.

Should the Review Panel believe that anything further would be desirable in order to place this application in even better condition for allowance, the Review Panel is invited to contact Applicant's undersigned representative.

Respectfully submitted,



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JAO:JEG/hms

Date: May 1, 2007

Attachment:  
Notice of Appeal

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